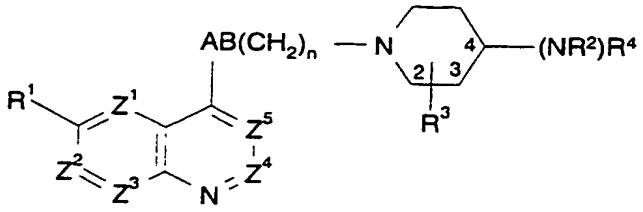
CLAIMS:

1. A compound of formula (I) or a pharmaceutically acceptable derivative thereof:



(I)

wherein:

one of Z^1, Z^2, Z^3, Z^4 and Z^5 is N, and the remainder are CR^{1a};

R^1 and R^{1a} are independently hydrogen; hydroxy; (C_{1-6})alkoxy optionally substituted by (C_{1-6})alkoxy, amino, piperidyl, guanidino or amidino optionally N-substituted by one or two (C_{1-6})alkyl, acyl or (C_{1-6})alkylsulphonyl groups, $CONH_2$, hydroxy, thiol, (C_{1-6})alkylthio, heterocyclylthio, heterocyclyloxy, arylthio, aryloxy, acylthio, acyloxy or (C_{1-6})alkylsulphonyloxy; (C_{1-6})alkoxy-substituted(C_{1-6})alkyl; halogen; (C_{1-6})alkyl; (C_{1-6})alkylthio; nitro; azido; acyl; acyloxy; (C_{1-6})alkylsulphonyl; (C_{1-6})alkylsulphoxide; arylsulphonyl; arylsulphoxide or an amino, piperidyl, guanidino or amidino group optionally N-substituted by one or two (C_{1-6})alkyl, acyl or (C_{1-6})alkylsulphonyl groups; and

additionally when Z^5 is CR^{1a}, R^{1a} may be (C_{1-4})alkyl-CO_2H or (C_{1-4})alkyl-$CONH_2$ in which the C_{1-4} alkyl is substituted by R^{12}; (C_{1-4})alkyl substituted by cyano, amino or guanidino; aminocarbonyl optionally substituted by hydroxy, (C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkylsulphonyl, trifluoromethylsulphonyl, (C_{1-6})alkenylsulphonyl, (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{2-6})alkenyloxycarbonyl, (C_{2-6})alkenylcarbonyl, or $CH(R^{13})CO_2H$ or $CH(R^{13})CO_2NH_2$ optionally further substituted by (C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl or (C_{2-6})alkenyl; hydroxy(C_{1-6})alkyl; carboxy; cyano or (C_{1-6})alkoxycarbonyl;

wherein R^{13} is a natural α-amino acid side chain or its enantiomer;

provided that when Z^1, Z^2, Z^3, Z^4 and Z^5 are CR^{1a}, then R^1 is not hydrogen;

R^2 is hydrogen, or (C_{1-4})alkyl or (C_{1-4})alkenyl optionally substituted with 1 to 3 groups selected from:

amino optionally substituted by one or two (C_{1-4})alkyl groups; carboxy; (C_{1-4})alkoxycarbonyl; (C_{1-4})alkylcarbonyl; (C_{2-4})alkenyloxycarbonyl; (C_{2-4})alkenylcarbonyl; aminocarbonyl wherein the amino group is optionally substituted by hydroxy, (C_{1-4})alkyl, hydroxy(C_{1-4})alkyl, aminocarbonyl(C_{1-4})alkyl, (C_{2-4})alkenyl, (C_{1-4})alkylsulphonyl, trifluoromethylsulphonyl, (C_{1-4})alkenylsulphonyl, (C_{1-4})alkoxycarbonyl, (C_{1-4})alkylcarbonyl, (C_{2-4})alkenyloxycarbonyl or (C_{2-4})alkenylcarbonyl; cyano; tetrazolyl; 2-oxo-oxazolidinyl optionally substituted by R^{10}; 3-hydroxy-3-cyclobutene-1,2-dione-4-yl; 2,4-thiazolidinedione-5-yl; tetrazol-5-ylaminocarbonyl; 1,2,4-triazol-5-yl optionally substituted by R^{10}; 5-oxo-1,2,4-oxadiazol-3-yl; thiol; halogen; (C_{1-4})alkylthio; trifluoromethyl; azido; hydroxy optionally substituted by (C_{1-4})alkyl, (C_{2-4})alkenyl, (C_{1-4})alkoxycarbonyl, (C_{1-4})alkylcarbonyl, (C_{2-4})alkenyloxycarbonyl, (C_{2-4})alkenylcarbonyl; oxo; (C_{1-4})alkylsulphonyl; (C_{2-4})alkenylsulphonyl; or (C_{1-4})aminosulphonyl wherein the amino group is optionally substituted by (C_{1-4})alkyl or (C_{2-4})alkenyl;

R^3 is hydrogen; or

R^3 is in the 2-, 3- or 4-position and is:

carboxy; (C_{1-6})alkoxycarbonyl; aminocarbonyl wherein the amino group is optionally substituted by hydroxy, (C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkylsulphonyl, trifluoromethylsulphonyl, (C_{1-6})alkenylsulphonyl, (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{2-6})alkenyloxycarbonyl or (C_{2-6})alkenylcarbonyl and optionally further substituted by (C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl or (C_{2-6})alkenyl; cyano; tetrazolyl; 2-oxo-oxazolidinyl optionally substituted by R^{10}; 3-hydroxy-3-cyclobutene-1,2-dione-4-yl; 2,4-thiazolidinedione-5-yl; tetrazol-5-ylaminocarbonyl; 1,2,4-triazol-5-yl optionally substituted by R^{10}; or 5-oxo-1,2,4-oxadiazol-3-yl; or

(C_{1-4})alkyl or ethenyl substituted with any of the substituents listed above for R^3 and up to 3 groups R^{12} independently selected from:

thiol; halogen; (C_{1-6})alkylthio; trifluoromethyl; azido; (C_{1-6})alkoxycarbonyl; (C_{1-6})alkylcarbonyl; (C_{2-6})alkenyloxycarbonyl; (C_{2-6})alkenylcarbonyl; hydroxy optionally substituted by (C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{2-6})alkenyloxycarbonyl, (C_{2-6})alkenylcarbonyl or aminocarbonyl wherein the amino group is optionally substituted by (C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkylcarbonyl or (C_{2-6})alkenylcarbonyl; amino optionally mono- or disubstituted by (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{2-6})alkenyloxycarbonyl, (C_{2-6})alkenylcarbonyl, (C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkylsulphonyl, (C_{2-6})alkenylsulphonyl or aminocarbonyl wherein the amino group is optionally substituted

by (C_{1-6})alkyl or (C_{2-6})alkenyl; aminocarbonyl wherein the amino group is optionally substituted by (C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{2-6})alkenyloxycarbonyl or (C_{2-6})alkenylcarbonyl and optionally further substituted by (C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl or (C_{2-6})alkenyl; oxo; (C_{1-6})alkylsulphonyl; (C_{2-6})alkenylsulphonyl; or (C_{1-6})aminosulphonyl wherein the amino group is optionally substituted by (C_{1-6})alkyl or (C_{2-6})alkenyl;
in addition when R^3 is disubstituted with a hydroxy or amino containing substituent and carboxy containing substituent these may together form a cyclic ester or amide linkage, respectively; or
when R^3 is in the 3- or 4-position it may with R^2 or R^4 form a C_{3-5} alkylene group optionally substituted by a group R^5 selected from:
(C_{1-12})alkyl; hydroxy(C_{1-12})alkyl; (C_{1-12})alkoxy(C_{1-12})alkyl; (C_{1-12})alkanoyloxy(C_{1-12})alkyl; (C_{3-6})cycloalkyl; hydroxy(C_{3-6})cycloalkyl; (C_{1-12})alkoxy(C_{3-6})cycloalkyl; (C_{1-12})alkanoyloxy(C_{3-6})cycloalkyl; (C_{3-6})cycloalkyl(C_{1-12})alkyl; hydroxy-, (C_{1-12})alkoxy- or (C_{1-12})alkanoyloxy-(C_{3-6})cycloalkyl(C_{1-12})alkyl; cyano; cyano(C_{1-12})alkyl; (C_{2-12})alkenyl; (C_{2-12})alkynyl; tetrahydrofuryl; mono- or di-(C_{1-12})alkylamino(C_{1-12})alkyl; acylamino(C_{1-12})alkyl; (C_{1-12})alkyl- or acyl-aminocarbonyl(C_{1-12})alkyl; mono- or di- (C_{1-12})alkylamino(hydroxy) (C_{1-12})alkyl; optionally substituted phenyl(C_{1-12})alkyl, phenoxy(C_{1-12})alkyl or phenyl(hydroxy)(C_{1-12})alkyl; optionally substituted diphenyl(C_{1-12})alkyl; optionally substituted phenyl(C_{2-12})alkenyl; optionally substituted benzoyl or benzoyl(C_{1-12})alkyl; optionally substituted heteroaryl or heteroaryl(C_{1-12})alkyl; and optionally substituted heteroaroyl or heteroaroyl(C_{1-12})alkyl;

R^4 forms a group with R^3 as above defined, or is a group $-CH_2-R^5$ where R^5 is as defined above:

n is 0, 1 or 2;

A is NR^{11} or CR^6R^7 and B is NR^{11}, O, SO_2 or CR^8R^9 and wherein:
each of R^6, R^7, R^8 and R^9 is independently selected from: hydrogen; (C_{1-6})alkylthio; halo; trifluoromethyl; azido; (C_{1-6})alkyl; (C_{2-6})alkenyl; (C_{1-6})alkoxycarbonyl; (C_{1-6})alkylcarbonyl; (C_{2-6})alkenyloxycarbonyl; (C_{2-6})alkenylcarbonyl; hydroxy, amino or aminocarbonyl optionally substituted as for corresponding substituents in R^3; (C_{1-6})alkylsulphonyl; (C_{2-6})alkenylsulphonyl; or (C_{1-6})aminosulphonyl wherein the amino group is optionally substituted by (C_{1-6})alkyl or (C_{1-6})alkenyl;

or R^6 and R^8 together represent a bond and R^7 and R^9 are as above defined;
or R^6 and R^7 or R^8 and R^9 together represent oxo;

provided that:
when A is NR^{11}, B is not NR^{11}, O or SO_2;
when A is CO, B is not CO, O or SO_2;
when n is 0 and A is NR^{11}, CR^8R^9 can only be CO;
when A is CR^6R^7 and B is SO_2, n is 0;
when n is 0, B is not NR^{11} or O; and
when A-B is $CR^7=CR^9$, n is 1 or 2;

R^{10} is selected from (C_{1-4})alkyl; (C_{2-4})alkenyl and aryl any of which may be optionally substituted by a group R^{12} as defined above; carboxy; aminocarbonyl wherein the amino group is optionally substituted by hydroxy, (C_{1-6})alkyl, (C_{2-6})alkenyl, (C_{1-6})alkylsulphonyl, trifluoromethylsulphonyl, (C_{1-6})alkenylsulphonyl, (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{2-6})alkenyloxycarbonyl or (C_{2-6})alkenylcarbonyl and optionally further substituted by (C_{1-6})alkyl or (C_{2-6})alkenyl; (C_{1-6})alkylsulphonyl; trifluoromethylsulphonyl; (C_{1-6})alkenylsulphonyl; (C_{1-6})alkoxycarbonyl; (C_{1-6})alkylcarbonyl; (C_{2-6})alkenyloxycarbonyl; and (C_{2-6})alkenylcarbonyl;

R^{11} is hydrogen; trifluoromethyl, (C_{1-6})alkyl; (C_{1-6})alkenyl; (C_{1-6})alkoxycarbonyl; (C_{1-6})alkylcarbonyl; aminocarbonyl wherein the amino group is optionally substituted by (C_{1-6})alkoxycarbonyl, (C_{1-6})alkylcarbonyl, (C_{1-6})alkenyloxycarbonyl, (C_{2-6})alkenylcarbonyl, (C_{1-6})alkyl or (C_{1-6})alkenyl and optionally further substituted by (C_{1-6})alkyl or (C_{1-6})alkenyl.

2. A compound according to claim 1 wherein:
(a) Z^1 is N, and Z^2-Z^5 are CH,
(b) Z^1-Z^5 are each CH, or
(c) Z^5 is N, and Z^1-Z^4 are CH.

3. A compound according to claim 1 or 2 wherein R^1 and R^{1a} are independently methoxy, amino(C_{3-5})alkyloxy, guanidino(C_{3-5})alkyloxy, piperidyl(C_{3-5})alkyloxy, nitro or fluoro.

4. A compound according to any one of the preceding claims wherein R^3 is hydrogen; optionally substituted aminocarbonyl; optionally substituted (C_{1-6})alkyl; carboxy(C_{1-4})alkyl; optionally substituted aminocarbonyl(C_{1-4})alkyl; cyano(C_{1-4})alkyl; optionally substituted 2-oxo-oxazolidinyl or optionally substituted 2-oxo-oxazolidinyl(C_{1-4}alkyl).

5. A compound according to any one of the preceding claims wherein R^3 is in the 3-position andthe substitutents at the 3- and 4-position of the piperidine ring are *cis*.

6. A compound according to any one of the preceding claims wherein A is NH and B is CO, or A is CHOH and B is CH_2.

7. A compound according to any one of the preceding claims wherein R^{11} is hydrogen.

8. A compound according to any one of the preceding claims wherein R^4 is (C_{5-12})alkyl, optionally substituted phenyl(C_{2-3})alkyl or optionally substituted phenyl(C_{3-4})alkenyl.

9. A pharmaceutical composition comprising a compound of formula (I), or a pharmaceutically acceptable derivative thereof, and a pharmaceutically acceptable carrier.

10. A method of treatment of bacterial infections in mammals which method comprises the administration to a mammal in need of such treatment an effective amount of a compound of formula (I), or a pharmaceutically acceptable derivative thereof.

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